CR-189397

P-9

FINAL REPORT
Contract NAS5-32478

Augmentation of the IUE Ultraviolet Spectral Atlas
Principal Investigator: Chi-Chao Wu

During the period supported by this contract, a total of 122 Short Wavelength Prime(SWP) and 219 Long Wavelength Prime (LWP) images were obtained with the International Ultraviolet Explorer(IUE) satellite. The goal of this program is to obtain high quality(as a high signal to noise ratio as practical) IUE images. Almost all the stars were observed by the Principal Investagator(PI) to ensure a high level of uniformity in the data gathering process. In order to maximize the signal to noise (S/N) ratio, except for a few faint very late type stars, essentially all stars were observed with trail or pseudo-trail techniques. With the aid from the IUE Observatory's Telescope Operators, the PI inspected every images as they were displayed for quick-look analysis. When an image did not meet the S/N level or the trail was not smooth, the star would be re-observed to get the high quality data required by this program.

Combined with stars observed during the previous IUE epochs, we have a total of 510 stars which have high quality IUE spectra. The distribution of spectral type and luminosity class of these stars are given in Table 1. As shown in Table 1, the spectral type-luminosity class(SpT-LumCl) coverage is reasonably good. Most SpT-LumCl have multiple entries to guard against peculiarity and variability. Multiple stars will also allow us to cover the range of effects caused by slightly different temperature, gravity, and metallicity that exist in a given SpT-LumCl. The M dwarfs in Table 1 are not very well populated, because the targets are very faint in the ultraviolet and are difficult to get good spectra in the high radiation US2 shifts and with the added problem of scattered light that contaminate the spectra during longer exposures. Furthermore, most of the M dwarfs are variables due to flaring. The F, G, K dwarfs and giants are well populated in Table 1. This is to allow the investigation of effects introduced by a range in temperature, gravity, and metallicity. These effects need to be well understood when astronomers study the stellar population contents of galaxies.

Three sample spectral plots are included in this report. We show the SWP images (wavelength range is 1100 to 2000 angstroms) of HD 101205, an O7 IIIn(f) star, and HD 33111, an A3 III star. We also include the LWP image(wavelength range is 1800 to 3200 angstroms) of HD 207089, a K0 Ib star. These plots give an indication of the quality of the data. The data are in the IUE archive for all interested astronomers to use. In a follow-on program, these spectra will be published in a forthcoming IUE

Newsletter. The new spectra will be published as another addendum to the Spectral Atlases of Wu et al. (1983, 1991).

REFERENCES

Wu, C.-C., Ake, T. B., Boggess, A., Bohlin, R. C., Imhoff, C. L., Holm, A. V., Levay, Z. G., Panek, R. J., Schiffer, F. H., III, and Turnrose, B. E. 1983, NASA IUE Newsletter, 22, 1.

Wu, C.-C., Crenshaw, D. M., Blackwell, J. H., Jr., Wilson-Diaz, D., Schiffer, F. H., III, Burstein, D., Fanelli, M. N., and O'Connell, R. W. 1991, NASA IUE Newsletter, 43, 1.

TABLE 1

DISTRIBUTION OF OBSERVED STARS IN THE HR DIAGRAM

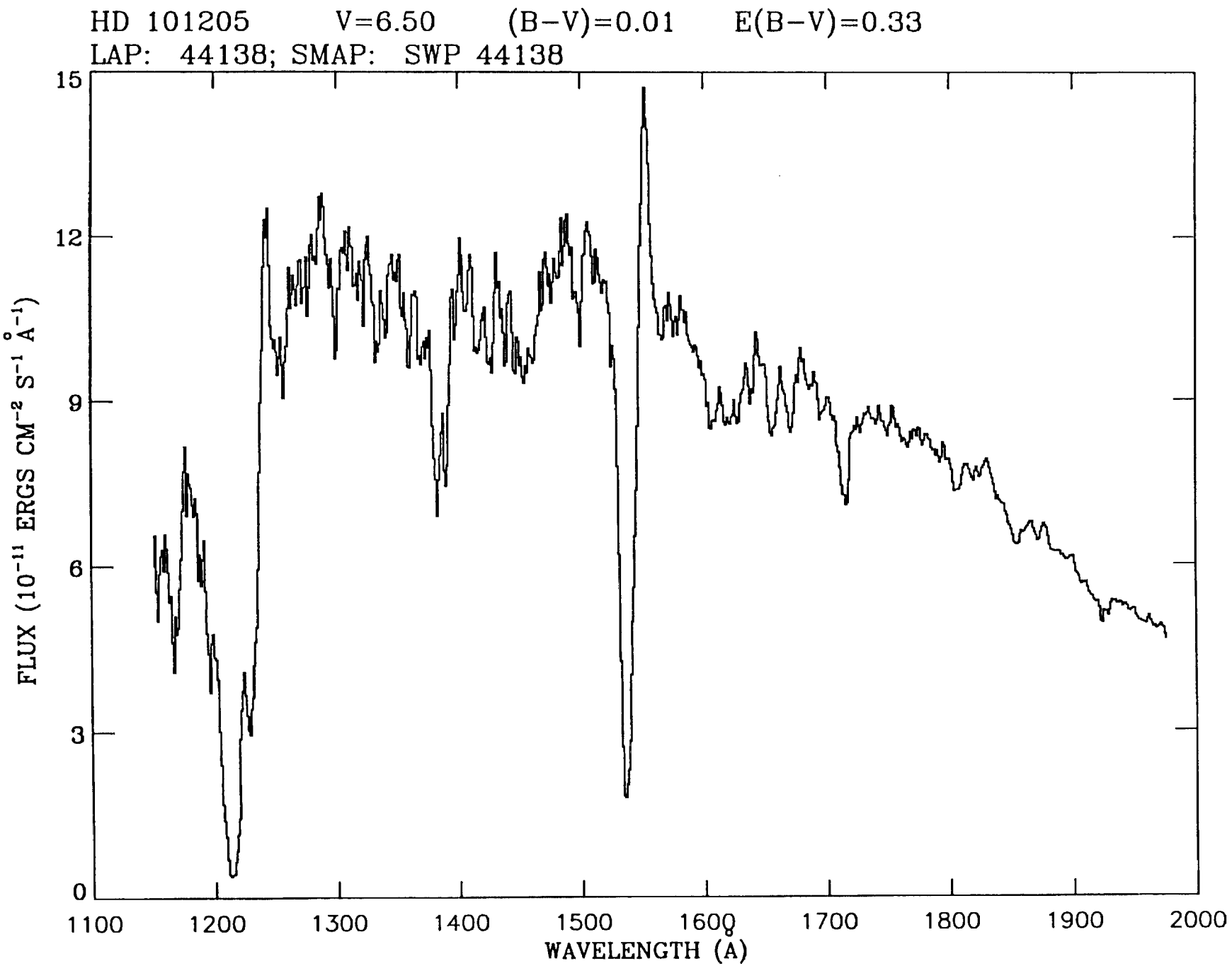
	V	IV	III	II	Ib	Iab	Ia
O3	2						1 (1)
4	2						
5	3 (1)		2 (1)				
6	1		1		2 (2)	1 (1)	
6.5							1
7	2		2 (2)	2 (1)	1 (1)		
7.5			1 (1)	1 (1)			
8	2 (1)		1 (1)		1 (1)		3
8.5	1 (1)						
9	2	1 (1)	1		2 (2)		2 (1)
9.5	1 (1)	1	2 (1)	1 (1)			1
B0	2 (1)		2	2 (2)	1	1	
0.5	1	1	2 (1)		1		1
1	2 (1)		4 (3)	3 (3)	3 (2)	2 (1)	1
1.5	2 (1)	1 (1)	1				
2	3 (2)	3 (2)	4 (3)	1 (1)	1		1 (1)
2.5	2 (1)	1	2		1 (1)		
3	5 (1)	2 (1)	1	1 (1)	1 (1)		1
4	3 (2)	2 (1)	3 (2)				
5	4 (1)	2 (1)	3 (2)	1	2		2
6	3 (2)	3 (1)	2 (1)		1		1 (1)
7	4 (2)		2				
8	3 (2)	1	3 (2)	1 (1)	1		1
9	2 (1)		2			2 (1)	1
9.5	5 (3)		1				
A0	5 (2)		2 (2)	2 (1)			2 (1)
1	5 (3)						1 (1)
2	3 (2)						1
3	5 (4)		2 (1)				
4	2 (1)						
5	2 (1)		1	1 (1)	1		
6	1						
7	2 (1)	3 (2)	1 (1)	1 (1)			
8	2 (1)						
9	1		1	1 (1)			

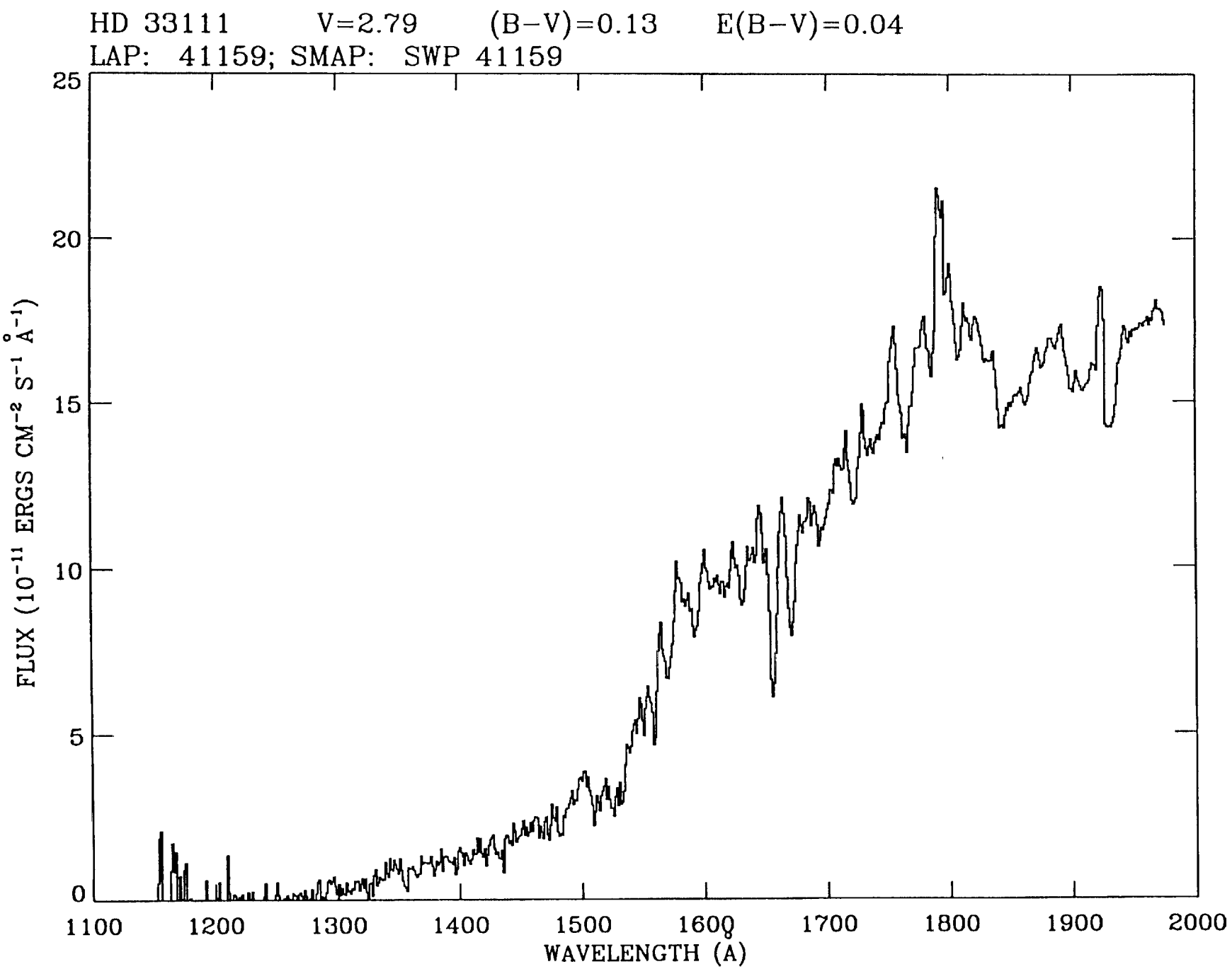
TABLE 1 (Continued)

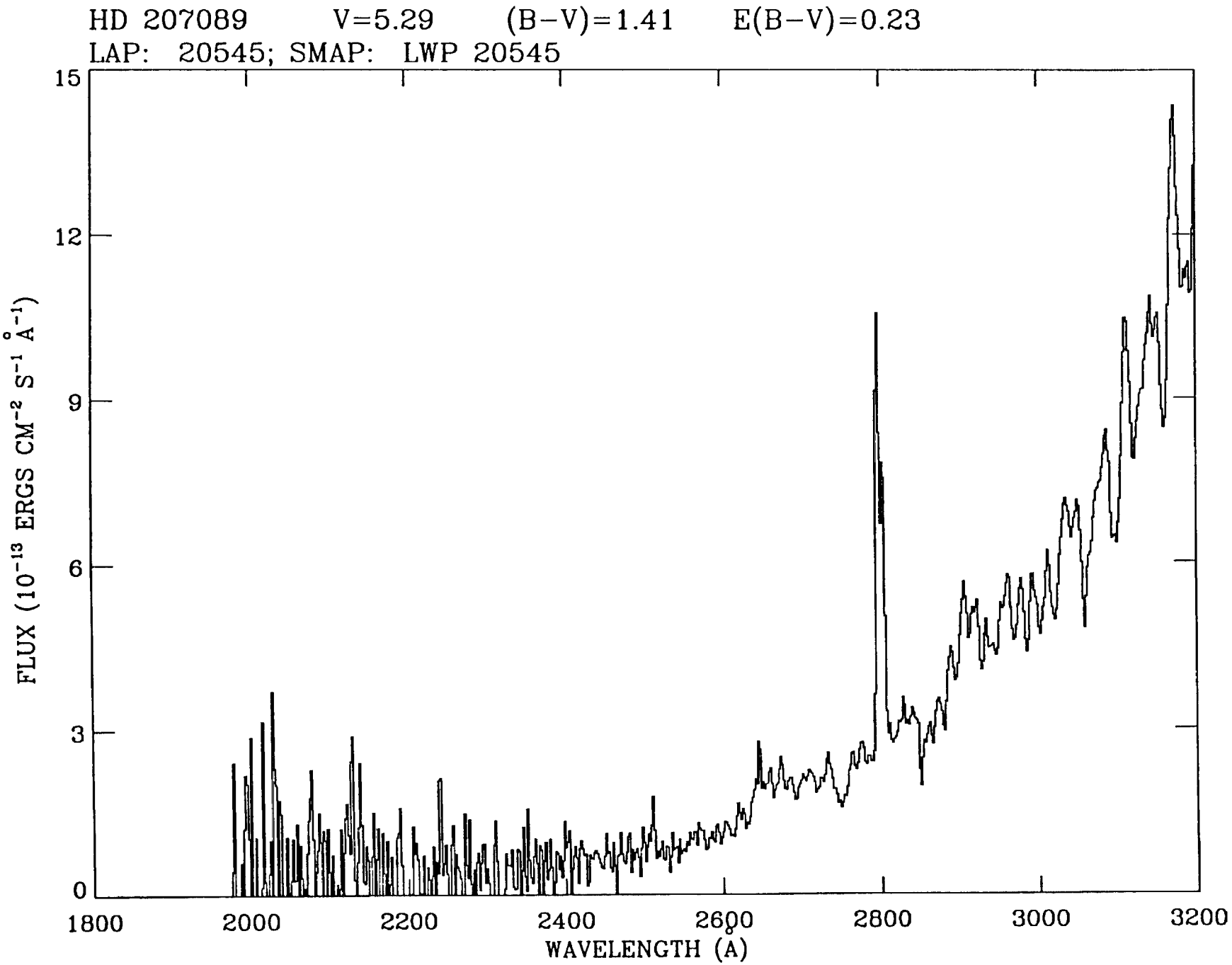
	V	IV	III	II	Ib	Iab	Ia
F0	1	2 (1)	1		2 (1)	2 (2)	1 (1)
1			1 (1)	1 (1)			
2	2 (1)	4 (2)	1		2 (2)		2
3	1		2 (2)				
4	2 (2)	1 (1)	2 (2)				
5	5 (1)	2 (1)	3 (3)	1 (1)	2 (1)		
6	8 (1)	4	2 (1)		1 (1)		
7	4 (1)	1	1 (1)		2 (2)		
8	8	2 (1)		1 (1)	2 (1)		1
9	6				1 (1)		
G0	12	3	2	1	2 (1)		1 (1)
1	6			1 (1)	1 (1)		
2	8	1		1	1		1 (1)
3	2		1 (1)		1		
4			2 (2)	1 (1)			1 (1)
5	6	1	3 (1)	2 (2)	1	1 (1)	1 (1)
6	3						
7			3 (3)		1 (1)		
8	3	3	6 (5)	2 (2)	1		
9			3 (2)				
K0	6	5	7 (3)		1 (1)	1 (1)	
1	2	3	4 (3)	1 (1)	1 (1)		
2	2	1 (1)	10 (2)	3 (3)	1		
3	2		7	3 (3)	1		
4			4 (3)				
4.5					1 (1)		
5	1		4 (2)	1 (1)	1	1 (1)	
6							
7	1		3 (2)		1		
8							
9							
M0	1 (1)		4 (3)			1 (1)	
0.5			1 (1)				
1			4 (3)	1 (1)			
2	2 (2)		3 (3)			2 (1)	1 (1)
3	1 (1)		3 (2)	1 (1)		1 (1)	
3.5			1 (1)				

TABLE 1 (Continued)

	V	IV	III	II	Ib	Iab	Ia
M4			2 (2)	2 (1)			
4.5			1 (1)				
5			1 (1)				
6	1 (1)		1 (1)				
7			1 (1)				
8							


HD 101205 V=6.50 (B−V)=0.01 E(B−V)=0.33
LAP: 44138; SMAP: SWP 44138
FLUX (10^{-11} ERGS CM^{-2} S^{-1} A^{-1})
WAVELENGTH (A)
0
3
6
9
12
15
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000


HD 33111 V=2.79 (B−V)=0.13 E(B−V)=0.04
LAP: 41159; SMAP: SWP 41159
FLUX (10^{-11} ERGS CM^{-2} S^{-1} $\AA^{-1}$)
WAVELENGTH (A)
0
5
10
15
20
25
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000


HD 207089 V=5.29 (B−V)=1.41 E(B−V)=0.23
LAP: 20545; SMAP: LWP 20545
FLUX (10^{-13} ERGS CM^{-2} S^{-1} $Å^{-1}$)
0
3
6
9
12
15
1800
2000
2200
2400
2600
2800
3000
3200
WAVELENGTH (A)

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	November 1994	Contractor Report

4. TITLE AND SUBTITLE

Augmentation of the IUE Ultaviolet Spectral Atlas

5. FUNDING NUMBERS

684.1

7N-89-
53154

6. AUTHOR(S)

Principal Investigator: Chi-Chao Wu

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

Computer Sciences Corporation
System Science Division
4061 Powder Mill Road
Calverton, MD 207 05

8. PERFORMING ORGANIZATION REPORT NUMBER

NAS5-32478

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

NASA Aeronautics and Space Administration
Washington, D.C. 20546-0001

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

CR-189397

11. SUPPLEMENTARY NOTES

Technical Monitor: Ronald Oliversen, Code 684.1

12a. DISTRIBUTION/AVAILABILITY STATEMENT

Unclassified-Unlimited
Subject Category: 89
Report available from the NASA Center for AeroSpace Information,
800 Elkridge Landing Road, Linthicum Heights, MD 21090; (301) 621-0390.

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

During the period supported by this contract, a total of 122 Short Wavelength Prime (SWP) and 219 Long Wavelength Prime (LWP) images were obtained with the International Ultraviolet Explorer (IUE) satellite. The goal of this program is to obtain high quality (as a high signal to noise ratio as practical) IUE images. Almost all the stars were observed by the Principal Investigator to ensure a high level of uniformity in the data gathering process. The results are presented in this final report.

14. SUBJECT TERMS

Short Wavelength Prime, Long Wavelength Prime, International Ultraviolet Explorer, Stars

15. NUMBER OF PAGES

8

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	Unlimited